Modules for Neurocognitive Psychology

Mastermodule

psy110 - Research methods

<table>
<thead>
<tr>
<th>Module label</th>
<th>Research methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module code</td>
<td>psy110</td>
</tr>
<tr>
<td>Credit points</td>
<td>12.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>360 h</td>
</tr>
</tbody>
</table>

Used in course of study

- Master's Programme Neurocognitive Psychology (Master) > Mastermodule

Contact person

- Module responsibility
  - Andrea Hildebrandt
- Authorized examiners
  - Andrea Hildebrandt

Entry requirements

- Enrolment in Master's programme Neurocognitive Psychology.

Skills to be acquired in this module

Goals of module:

Students will acquire basic knowledge in planning empirical investigations, managing and understanding quantitative data and conducting a wide variety of multivariate statistical analyses. They will learn how to use the statistical methodology in terms of good scientific practice and how to interpret, evaluate and synthesize empirical results from the perspective of statistical modeling and statistical learning in basic and applied research context. The courses in this module will additionally point out statistical misconceptions and help students to overcome them.

Competencies:

++ interdisciplinary knowledge & thinking
++ statistics & scientific programming
++ data presentation & discussion
+ independent research
+ scientific literature
++ ethics / good scientific practice / professional behavior
++ critical & analytical thinking
++ scientific communication skills
+ group work

Module contents

Part 1: Multivariate Statistics I (lecture): winter

- Graphical representation of multivariate data
- The Generalized Linear Modeling (GLM) framework
- Multiple and moderated linear regression with quantitative and qualitative predictors
- Logistic regression
- Multilevel regression (Generalized Linear Mixed Effects Modeling – GLMM)
- Non-linear regression models
- Path modeling
- Factor analysis (exploratory & confirmatory)
- (Multilevel) Structural equation modeling (SEM linear and non-linear)

Part 2: Analysis Methods with R (seminar): winter and summer

- Data examples and applications of GLM, GLMM, polynomial, spline and local regression, path modeling, factor analyses and SEM

Part 3: Multivariate Statistics II (lecture): summer

- Supervised and unsupervised statistical learning and prediction
- Regularized regression
- Resampling methods
- Tree-based methods
- Support Vector Machines
- Neural Networks (basics)
- Principal components and clustering

**Part 4: Evaluation research (seminar): summer**

- Paradigms and methods in applied evaluation research (quantitative, mixed-methods)
- Types of studies and designs in evaluation research (experimental, quasi-experimental, (multiple) time series, etc.)
- Specific statistical tools (e.g., Propensity score matching)
- Research synthesis and meta-analysis

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**Reader’s advisory**

**Links**

<table>
<thead>
<tr>
<th>Language of instruction</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration (semesters)</td>
<td>2 Semester</td>
</tr>
<tr>
<td>Module frequency</td>
<td>The module will start every winter term.</td>
</tr>
<tr>
<td>Module capacity</td>
<td>unlimited</td>
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<td>Modullevel</td>
<td>MM (Mastermodul / Master module)</td>
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<tr>
<td>Modullevel</td>
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<tr>
<td>Modulart</td>
<td>Pflicht / Mandatory</td>
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<tr>
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<td>Pflicht / Mandatory</td>
</tr>
<tr>
<td>Lern-/Lehrform / Type of program</td>
<td>Parts 1 and 3: lectures; Parts 2 and 4: seminars; additional tutorials are offered.</td>
</tr>
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<tr>
<td>Vorkenntnisse / Previous knowledge</td>
<td>basic statistics; otherwise please attend Introductory Course Statistics</td>
</tr>
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<td>Vorkenntnisse / Previous knowledge</td>
<td>basic statistics; otherwise please attend Introductory Course Statistics</td>
</tr>
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**Examination**

<table>
<thead>
<tr>
<th>Final exam of module</th>
<th>Time of examination</th>
<th>Type of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The module will be tested with an oral exam (20 min).</td>
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</tr>
<tr>
<td></td>
<td>Required active participation for gaining credits: attendance of at least 70% in the seminars (use attendance sheet that will be handed out in the beginning of the term).</td>
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</table>

**Course type**

<table>
<thead>
<tr>
<th>Comment</th>
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</thead>
<tbody>
<tr>
<td>Lecture</td>
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<tr>
<td>Seminar</td>
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<tr>
<td>Tutorial</td>
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**SWS**

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Workload attendance</th>
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<tbody>
<tr>
<td>SuSe and WiSe</td>
<td>56 h</td>
</tr>
<tr>
<td>SuSe and WiSe</td>
<td>56 h</td>
</tr>
<tr>
<td>SuSe and WiSe</td>
<td>0 h</td>
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</table>

**Total time of attendance for the module**

| 112 h |
psy121 - Psychological assessment and diagnostics

Module label: Psychological assessment and diagnostics
Module code: psy121
Credit points: 12.0 KP
Workload: 360 h

Used in course of study: Master's Programme Neurocognitive Psychology (Master) > Mastermodule

Contact person:
- Module responsibility: Andrea Hildebrandt
- Authorized examiners: Andrea Hildebrandt, Andreas Hellmann
- Module counseling: Stefan Debener

Entry requirements:

Skills to be acquired in this module:

Module contents:

Reader’s advisory:

Links:

Language of instruction: English
Duration (semesters): 2 Semester

Module frequency:

Module capacity: unlimited

Modullevel:

Modulart:

Lern-/Lehrform / Type of program:

Vorkenntnisse / Previous knowledge:

Examination:

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
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<tbody>
<tr>
<td>Lecture</td>
<td></td>
<td>4.00</td>
<td>SuSe and WiSe</td>
<td>56 h</td>
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<tr>
<td>Seminar</td>
<td></td>
<td>4.00</td>
<td>SuSe and WiSe</td>
<td>56 h</td>
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</table>

Total time of attendance for the module: 112 h
psy130 - Communication of scientific results

Module label: Communication of scientific results
Module code: psy130
Credit points: 6.0 KP
Workload: 180 h

Used in course of study:
- Master's Programme Neurocognitive Psychology (Master) > Mastermodule

Contact person:
- Module responsibility: Christoph Siegfried Herrmann
- Authorized examiners:
  - Christoph Siegfried Herrmann
  - Florian Kasten
  - Daniel Strüber
- Module counseling: Daniel Strüber

Entry requirements:
- Enrolment in Master's programme Neurocognitive Psychology.

Skills to be acquired in this module:

**Goals of module:**
Students will acquire specific knowledge about the presentation of scientific results both orally and in writing. Students will learn modern techniques for presentation, literature research and writing skills. They will also be taught about arguing scientifically.

**Competencies:**
- ++ data presentation & discussion
- ++ scientific literature
- ++ scientific English / writing
- ++ scientific communication skills
- + group work

Module contents:

**Part 1: Communication of scientific results (seminar)**
- Literature search
- Presentation skills
- Writing skills

**Part 2: Psychological colloquium**
- Experienced scientists from various psychological disciplines will be giving talks about their experimental results. Speakers will be invited also from other universities. Students are encouraged to discuss the results with the experts and to make suggestions on whom to invite

Reader's advisory:

Links:
- Language of instruction: English
- Duration (semesters): 1-2 Semester
- Module frequency:
  - Part 1 will be offered every winter term.
  - Part 2 will be offered every semester.
- Module capacity: unlimited
- Reference text:
  - Students can choose whether they want to attend the colloquium in the first, second or both semesters.
- **Modullevel:**
  - MM (Mastermodul / Master module)
- **Modulart:**
  - Pflicht / Mandatory
- **Lern-/Lehrform / Type of program:**
  - Communication of scientific results: seminar; Psychological colloquium: colloquium

Examination:
- Time of examination: during winter term
- Type of examination: Oral presentation
<table>
<thead>
<tr>
<th>Examination</th>
<th>Time of examination</th>
<th>Type of examination</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Required active participation for gaining credits: 70% attendance of the seminar and at least 8 colloquia (use attendance sheet that will be handed out in the beginning of the term) and active discussion in at least 1 colloquium.</td>
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<table>
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<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
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<tr>
<td>Seminar</td>
<td></td>
<td>2.00</td>
<td>WiSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Colloquium</td>
<td></td>
<td>2.00</td>
<td>SuSe and WiSe</td>
<td>28 h</td>
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<td><strong>Total time of attendance for the module</strong></td>
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<td></td>
<td>56 h</td>
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</table>
psy141 - Minor

Module label: Minor
Module code: psy141
Credit points: 6.0 KP
Workload: 180 h

Used in course of study:
- Master's Programme Neurocognitive Psychology (Master) > Mastermodule

Contact person:
- Module counseling
  - Jochem Rieger
  - Kerstin Bleichner

Entry requirements:
Enrolment in Master's programme Neurocognitive Psychology.

Skills to be acquired in this module:

Goals of module:
Students will gain an overview of non-psychological topics related to cognitive neuroscience and neuropsychology. They will see how psychological theories apply in other fields. Students can strengthen their own professional profile.

Competencies:
++ interdisciplinary knowledge & thinking

Module contents:

Students can take Master modules and courses from the fields

- Biology
- Neurosciences
- Computer Science
- Physics
- Mathematics
- Pedagogy
- Philosophy
- related fields
- Psychology (additional elective module (NOT psy170, psy220, psy270, psy280) or from another study programme)

Students whose first language is not German, may take German classes.

Upon approval, German-speaking students can attend a career-relevant language course (i.e. necessary for internship, practical project or Master's thesis). English classes cannot be taken as Minor.

A list of already approved courses/modules can be found on our website. You can take other courses/modules upon approval.

We recommend taking modules/courses that strengthen your own professional profile.

Reader's advisory:

Links:
List of approved courses/modules and approval form:
https://uol.de/en/psychology/master/course-overview/ → Supporting documents

Languages of instruction:
English, German

Duration (semesters):
1 Semester

Module frequency:
irregular

Module capacity:
unlimited

Reference text:
PLEASE NOTE:

If you want to take a module/course which is not listed in the list of approved courses/modules, please request approval BEFORE you start the course/module (list of approved courses/modules and approval form can be found on our website)

If you want to take an additional elective module for your Minor (taking only a part of an elective module is not possible), you need to inform the contact person for the respective module in writing BEFORE the start of the module. If your request is NOT rejected in written form within 4 weeks, the module counts as
approved for the Minor. You will receive a pass/fail for this module. You CANNOT use it afterwards as a normal elective module. You can also NOT redeicate an elective that you have already started as your Minor.

Bachelor level courses are NOT acceptable. Note that Bachelor level courses can be listed in some Master programmes (e.g. Master of Education). This does not qualify a Bachelor level course for the Minor module.

It is your responsibility to ask the teacher whether you can take part.

<table>
<thead>
<tr>
<th>Modullevel</th>
<th>MM (Mastermodul / Master module)</th>
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<tr>
<td>Modulart</td>
<td>Pflicht / Mandatory</td>
</tr>
<tr>
<td>Lern-/Lehrform / Type of program</td>
<td>Lectures and seminars (depends on the chosen modules)</td>
</tr>
<tr>
<td>Vorkenntnisse / Previous knowledge</td>
<td>Lectures and seminars (depends on the chosen modules)</td>
</tr>
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<table>
<thead>
<tr>
<th>Examination</th>
<th>Time of examination</th>
<th>Type of examination</th>
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</thead>
<tbody>
<tr>
<td>Final exam of module</td>
<td>VA-Auswahl</td>
<td>If grades are earned in the minor, those are counted as pass/fail. Certificates for grades can be separately requested from the examination office.</td>
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| SWS | 4.00 |
| Frequency | SuSe or WiSe |
| Workload attendance | 56 h |
## psy150 - Clinical Psychology

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<tr>
<th>Module label</th>
<th>Clinical Psychology</th>
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<tr>
<td>Module code</td>
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<tr>
<td>Credit points</td>
<td>9.0 KP</td>
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<tr>
<td>Workload</td>
<td>270 h</td>
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<tr>
<td>Used in course of study</td>
<td>• Master's Programme Neurocognitive Psychology (Master) &gt; Mastermodule</td>
</tr>
<tr>
<td>Contact person</td>
<td>Module responsibility</td>
</tr>
<tr>
<td></td>
<td>○ Christiane Margarete Thiel</td>
</tr>
<tr>
<td></td>
<td>Authorized examiners</td>
</tr>
<tr>
<td></td>
<td>○ Christiane Margarete Thiel</td>
</tr>
<tr>
<td>Entry requirements</td>
<td>Enrolment in Master's programme Neurocognitive Psychology.</td>
</tr>
<tr>
<td>Skills to be acquired in this module</td>
<td><strong>Goals of the Module:</strong> Students acquire scientifically sound, critical thinking regarding the genesis and psychopharmacological treatment of various mental illnesses; decision making based on the medical guidelines and evidence-based practice. <strong>Competencies:</strong> ++ Neuropsychological / neurophysiological knowledge + experimental methods + data presentation &amp; discussion + scientific literature + critical &amp; analytical thinking + knowledge transfer</td>
</tr>
</tbody>
</table>

### Module contents

The first part of the module provides students with a theoretical and practical background on neurobiological and biochemical bases of psychiatric disorders and pharmacological interventions. This will be complemented by psychiatric interviews in simulated patients focusing on psychopathological assessment. In the second part, the students will learn to plan and assess the effectiveness of psychological interventions for selected disorders.

#### Part 1: Neurobiological basis of psychiatric disorders and pharmacological intervention (lecture and seminar): winter
- Basics of neurotransmitter systems and psychopharmacology
- Substance Abuse (e.g. psychostimulants, hallucinogens)
- Depression
- Anxiety Disorders
- Alzheimer's Disease
- Schizophrenia
- psychopathological assessment

The seminar will be given in German as clinicians and patient actors are involved.

#### Part 2: Psychological interventions within the framework of evidence-based medicine (seminar): summer
(parly in German): Concepts of evidence based treatment and treatment of acquired dysfunctions of the brain
- Treatment studies of selected psychiatric disorders

### Reader's advisory

- Selected papers (part 2)
**Links**

<table>
<thead>
<tr>
<th>Languages of instruction</th>
<th>English, German</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration (semesters)</td>
<td>2 Semester</td>
</tr>
<tr>
<td>Module frequency</td>
<td>Part 1 will be offered every winter term, part 2 every summer term.</td>
</tr>
<tr>
<td>Module capacity</td>
<td>unlimited</td>
</tr>
<tr>
<td>Reference text</td>
<td>Please note: Parts of this module that teach clinical contents will be taught in German (partly with accompanying English materials). To follow all parts of this module, students need to be able to follow a lecture in German. Presentations can be given in English.</td>
</tr>
</tbody>
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<tr>
<th>Modullevel</th>
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<tr>
<td>Modulart</td>
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<td>Lern-/Lehrform / Type of program</td>
<td>Part 1: lecture and seminar: part 2: seminar</td>
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<table>
<thead>
<tr>
<th>Vorkenntnisse / Previous knowledge</th>
<th>Examination</th>
<th>Time of examination</th>
<th>Type of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final exam of module</td>
<td>mid-February</td>
<td>The module will be tested with a written exam (2 h) on the contents of part 1. Required active participation for gaining credits: 1 presentation participation in discussions on other presentations attendance of at least 70% in the seminars (use attendance sheet that will be handed out in the beginning of the term).</td>
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</table>

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td></td>
<td>2.00</td>
<td>WiSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Seminar</td>
<td></td>
<td>4.00</td>
<td>SuSe and WiSe</td>
<td>56 h</td>
</tr>
</tbody>
</table>

**Total time of attendance for the module** 84 h
psy170 - Neurophysiology

Module label: Neurophysiology  
Module code: psy170  
Credit points: 6.0 KP  
Workload: 180 h

Used in course of study: Master's Programme Neurocognitive Psychology (Master) > Mastermodule

Contact person

- Module responsibility
  - Stefan Debener

- Authorized examiners
  - Stefan Debener

Entry requirements

Enrolment in Master's programme Neurocognitive Psychology.

Skills to be acquired in this module

Goals of module:
Students will understand the basic concepts of biomedical signal processing. They will use EEG analysis tools interactively and independently and will understand the complete chain of EEG analysis steps, from data import to the illustration of results. They will be able to use open source tools for EEG analysis and apply theoretical knowledge to practical problems of physiology.

Competencies:

++ Neuropsychological / neurophysiological knowledge  
++ experimental methods  
++ statistics & scientific programming  
++ ethics / good scientific practice / professional behavior  
+ group work  
+ project & time management

Module contents

Students will acquire specific knowledge about neurophysiology and neuroanatomy, learn the fundamental concepts of multi-channel EEG analysis, and acquire hands-on skills in using EEGLAB, an open-source software toolbox for advanced EEG analysis.

Part 1: Neurophysiology and neuroanatomy (lecture): winter  
Neurophysiology, EEG, EMG, ECG  
Neuroanatomy  
Time-domain and frequency-domain analysis methods

Part 2: EEG recording and analysis (seminar): winter  
Recording and analysis of biomedical signals  
Averaging, filtering, signal-to-noise  
Topographical EEG analysis

Part 3: EEG analysis with Matlab (seminar): summer  
EEGLAB file I/O, data structure and scripting  
Preprocessing, artefact rejection and artefact correction  
Statistical decomposition  
Event-related potentials, topographical mapping and power spectra  
Illustration of results

Reader's advisory


Links

Language of instruction: English
<table>
<thead>
<tr>
<th><strong>Duration (semesters)</strong></th>
<th>2 Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Module frequency</strong></td>
<td>The module will start every winter term.</td>
</tr>
<tr>
<td><strong>Module capacity</strong></td>
<td>18 (The lecture is not restricted.)</td>
</tr>
<tr>
<td><strong>Reference text</strong></td>
<td>PLEASE NOTE: We strongly recommend to take either psy170, psy270, psy280, or psy220 to gain methodological competencies (EEG, fMRI, TBS, HCI) that are needed for most practical projects and Master’s theses!</td>
</tr>
<tr>
<td><strong>Modullevel</strong></td>
<td>MM (Mastermodul / Master module)</td>
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</tr>
<tr>
<td><strong>Examination</strong></td>
<td>Time of examination</td>
</tr>
<tr>
<td><strong>Final exam of module</strong></td>
<td>exam period at the end of the summer term</td>
</tr>
<tr>
<td><strong>Course type</strong></td>
<td>Comment</td>
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<tr>
<td><strong>Lecture</strong></td>
<td>2 semester hours per week in first half of the winter term.</td>
</tr>
<tr>
<td><strong>Seminar</strong></td>
<td>2 semester hours per week in second half of the winter term. 2 semester hours per week in summer term.</td>
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**Total time of attendance for the module** 56 h
# psy181 - Neurocognition

<table>
<thead>
<tr>
<th>Module label</th>
<th>Neurocognition</th>
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</thead>
<tbody>
<tr>
<td>Module code</td>
<td>psy181</td>
</tr>
<tr>
<td>Credit points</td>
<td>6.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>180 h</td>
</tr>
<tr>
<td>Used in course of study</td>
<td>Master's Programme Neurocognitive Psychology (Master) &gt; Mastermodule</td>
</tr>
</tbody>
</table>

## Contact person

- Module responsibility
  - Christiane Margarete Thiel
- Authorized examiners
  - Christiane Margarete Thiel

## Entry requirements

Enrolment in Master's programme Neurocognitive Psychology.

## Skills to be acquired in this module

### Goals of module:
Students should be able to recognize and critically evaluate the value of considering neuroscience in the study of psychological topics.

### Competencies:
- ++ neuropsychological / neurophysiological knowledge
- ++ interdisciplinary knowledge & thinking
- ++ data presentation & discussion
- ++ scientific literature
- + scientific communication skills
- + group work

## Module contents

Students will first acquire a general understanding of the brain mechanisms of different cognitive functions and the methods used to study these functions. They will then apply this knowledge by discussing current research topics (part 1). General knowledge will be focused on the relation between the development of the human brain and the cognitive processes it supports (part 2).

### Part 1: Introduction to cognitive neuroscience (lecture and seminar): winter

- Brain and cognition, methods of cognitive neuroscience
- Attention, learning and memory
- Emotional and social behaviour
- Language, executive functions

### Part 2: Neurocognitive development (seminar): summer

- Brain development and cortical plasticity
- Effects of early-life stress on brain development
- Development of object recognition, social cognition, memory, and executive functions

## Reader's advisory


## Links

- Language of instruction: English
- Duration (semesters): 2 Semester
- Module frequency: The module will be offered every winter term.
- Module capacity: 20
  - Part 1 (lecture and seminar) are unrestricted, part 2 is restricted to 20 students.
<table>
<thead>
<tr>
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<td>Part 1: lecture and seminar; Part 2: seminar</td>
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</tbody>
</table>

**Vorkenntnisse / Previous knowledge**

<table>
<thead>
<tr>
<th>Examination</th>
<th>Time of examination</th>
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<tbody>
<tr>
<td>Final exam of module</td>
<td>mid-February</td>
<td>The module will be tested with a written exam of 2 h duration on the contents of part 1. Required active participation for gaining credits: 1 presentation participation in discussions on other presentations attendance of at least 70% in the seminars (use attendance sheet that will be handed out in the beginning of the term).</td>
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</table>

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td></td>
<td>1.00</td>
<td>WiSe</td>
<td>14 h</td>
</tr>
<tr>
<td>Seminar</td>
<td></td>
<td>3.00</td>
<td>WiSe</td>
<td>42 h</td>
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</tbody>
</table>

**Total time of attendance for the module**  56 h
psy190 - Sex and Cognition

Module label: Sex and Cognition
Module code: psy190
Credit points: 6.0 KP
Workload: 180 h

Used in course of study: Master's Programme Neurocognitive Psychology (Master) > Mastermodule

Contact person:
Module responsibility
- Daniel Strüber
Authorized examiners
- Daniel Strüber

Entry requirements: Enrolment in Master's programme Neurocognitive Psychology. Neuroscience students can take part on request.

Skills to be acquired in this module:

Goals of module:
Students will acquire specific knowledge about sex differences in cognitive abilities and social behaviours. They will be able to understand the interrelated impact of social and biological influences on the brain's control of the (sex-specific) behaviours. Students should be able to critically evaluate behavioural sex differences from different perspectives and to reflect on possible implications for society.

Competencies:
++ neuropsychological / neurophysiological knowledge
+ interdisciplinary knowledge & thinking
++ data presentation & discussion
++ scientific literature
+ critical & analytical thinking
++ scientific communication skills
+ group work
+ project & time management

Inhalte

Module contents

Part 1: Introduction to the study of sex differences (lecture): winter
The measurement of sex differences
Sex differences in emotion
Sex differences in aggression
Sex differences in cognitive abilities
Hormones, sexual differentiation, and gender identity
Sex hormones and play preferences
Sex differences in hemispheric organization
Brain size and intelligence

Part 2: Sex, brain, and behaviour (seminar): winter
Sex differences in empathy
The extreme male brain theory of autism (S. Baron-Cohen)
Sex differences in neuropsychiatric disorders
Sex differences in stress response
Social implications of sex differences

Reader's advisory

Language of instruction | English
---|---
Duration (semesters) | 1 Semester
Module frequency | The module will be offered every winter term.
Module capacity | 30
Modul level | MM (Mastermodul / Master module)
Modul level | MM (Mastermodul / Master module)
Modular | Wahlpflicht / Elective
Modular | Wahlpflicht / Elective
Lern-Lehrform / Type of program | Part 1: lecture; Part 2: seminar
Lern-Lehrform / Type of program | Part 1: lecture; Part 2: seminar
Vorkenntnisse / Previous knowledge

<table>
<thead>
<tr>
<th>Examination</th>
<th>Time of examination</th>
<th>Type of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final exam of module</td>
<td>during winter term</td>
<td>oral presentation</td>
</tr>
</tbody>
</table>

Required active participation for gaining credits: participation in discussions on other presentations attendance of at least 70% in the seminar (use attendance sheet that will be handed out in the beginning of the term).

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td></td>
<td>2.00</td>
<td>WiSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Seminar</td>
<td></td>
<td>2.00</td>
<td>WiSe</td>
<td>28 h</td>
</tr>
</tbody>
</table>

Total time of attendance for the module | 56 h |
psy201 - Neuropsychology

Module label: Neuropsychology
Module code: psy201
Credit points: 6.0 KP
Workload: 180 h

Used in course of study:
- Master's Programme Neurocognitive Psychology (Master) > Mastermodule

Contact person:
- Module responsibility: Stefan Debener
- Authorized examiners: Stefan Debener

Entry requirements:
Enrolment in Master's programme Neurocognitive Psychology.

Skills to be acquired in this module:

Goals of module:
Students will learn to understand changes in thinking and behaviour that may arise from brain dysfunctions (part 1, 3), acquire specific knowledge on cognitive rehabilitation (part 2), and learn to understand, communicate and evaluate progress in clinical practice and experimental research in neuropsychology (part 3).

Competencies:
++ neuropsychological / neurophysiological knowledge
+ interdisciplinary knowledge & thinking
++ experimental methods
+ data presentation & discussion
++ scientific literature
+ critical & analytical thinking
+ scientific communication skills

Module contents:

Part 1: Introduction to Clinical Neuropsychology (lecture): winter
- Cortical lobes (anatomy, functions, lesion symptoms, neuropsychological tests)
- Higher functions (learning & memory, language, emotion, spatial behavior attention)
- Plasticity and disorders (development, learning and reading disabilities, recovery)

Part 2: Cognitive Neurorehabilitation (seminar): summer
- Behavioural and neuropsychological approaches
- Neurofeedback in neurorehabilitation and ADHD
- Memory rehabilitation
- Effects of physical activity on cognition
- Motor recovery

Part 3: Topics in Clinical Neuropsychology (seminar; taught partly in German): winter
- Clinical neuroanatomy
- Neurodegenerative diseases
- Dementia

Choose either part 2 or part 3!

Reader's advisory

Links

Language of instruction: English

Duration (semesters): 1-2 Semester

Module frequency:
The module will start every winter term.

Module capacity:
30 (Part 3 is not restricted.)

Reference text:
Part 1 (lecture) is mandatory. Choose either part 2 or part 3 (seminars).
Note: The lecture of part 3 is given in German with accompanying English materials. Students who cannot follow a lecture in German are given priority in part 2.

Modullevel:
MM (Mastermodul / Master module)
<table>
<thead>
<tr>
<th>Modul level</th>
<th>MM (Mastermodul / Master module)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modulart</td>
<td>Wahlpflicht / Elective</td>
</tr>
<tr>
<td>Lern-Lehrform / Type of program</td>
<td>Part 1: lecture; Part 2: seminar; Part 3: seminar</td>
</tr>
<tr>
<td>Lern-Lehrform / Type of program</td>
<td>Part 1: lecture; Part 2: seminar; Part 3: seminar</td>
</tr>
</tbody>
</table>

**Vorkenntnisse / Previous knowledge**

<table>
<thead>
<tr>
<th>Examination</th>
<th>Time of examination</th>
<th>Type of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final exam of module</td>
<td>exam period at the end of winter term</td>
<td>The module will be tested with a written exam of 2 h duration. Required active participation for gaining credits: presentation participation in discussions on other presentations attendance of at least 70% in the seminars (use attendance sheet that will be handed out in the beginning of the term).</td>
</tr>
</tbody>
</table>

**Course type**

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td></td>
<td>2.00</td>
<td>WiSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Seminar</td>
<td></td>
<td>2.00</td>
<td>SuSe or WiSe</td>
<td>28 h</td>
</tr>
</tbody>
</table>

**Total time of attendance for the module** 56 h
### psy210 - Applied Cognitive Psychology

<table>
<thead>
<tr>
<th>Module label</th>
<th>Applied Cognitive Psychology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module code</td>
<td>psy210</td>
</tr>
<tr>
<td>Credit points</td>
<td>6.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>180 h</td>
</tr>
<tr>
<td>Used in course of study</td>
<td>Master's Programme Neurocognitive Psychology (Master) &gt; Mastermodule</td>
</tr>
<tr>
<td>Contact person</td>
<td>Module responsibility</td>
</tr>
<tr>
<td></td>
<td>- Jochem Rieger</td>
</tr>
<tr>
<td></td>
<td>Authorized examiners</td>
</tr>
<tr>
<td></td>
<td>- Jochem Rieger</td>
</tr>
<tr>
<td></td>
<td>- Anirudh Unni</td>
</tr>
<tr>
<td>Entry requirements</td>
<td>Enrolment in Master's programme Neurocognitive Psychology. Neuroscience students can take part on request.</td>
</tr>
</tbody>
</table>
| Skills to be acquired in this module | Goals of the module: Students will gain an overview of theories of (Neuro)Cognitive Psychology with potential for application. On completion of this module students should have a repertoire of cognitive psychology concepts relevant for real world situations, be able to transfer the learned theoretical concepts into practical contexts and evaluate potential issues arising in the process of translation.

<table>
<thead>
<tr>
<th>Competencies:</th>
</tr>
</thead>
<tbody>
<tr>
<td>++ Neuropsychological / neurophysiological knowledge</td>
</tr>
<tr>
<td>+ interdisciplinary knowledge &amp; thinking</td>
</tr>
<tr>
<td>+ experimental methods</td>
</tr>
<tr>
<td>+ scientific literature</td>
</tr>
<tr>
<td>+ ethics / good scientific practice / professional behavior</td>
</tr>
<tr>
<td>+ critical &amp; analytical thinking</td>
</tr>
<tr>
<td>+ scientific communication skills</td>
</tr>
<tr>
<td>+ knowledge transfer</td>
</tr>
</tbody>
</table>

| Module contents | The module will cover core concepts of cognitive psychology, their neuronal basis, basic knowledge of neuroimaging and data analysis techniques. Special emphasis will be put on research aiming at complex real-world settings and translation of basic science into practice. Examples of successful transfers will be analyzed. The lecture provides the theoretical basis. In the seminar the material is consolidated by examples from the literature which will be presented, critically analyzed and discussed. |

<table>
<thead>
<tr>
<th>Part 1: (Neuro)Cognitive Psychology in the wild I (lecture): summer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neurocognitive Psychology with emphasis in real world context</td>
</tr>
<tr>
<td>Methodological considerations: Generalization, validity of theories and research methods</td>
</tr>
<tr>
<td>Information uptake and representation: Sensation, perception, categorization</td>
</tr>
<tr>
<td>Selection of information and capacity: Attention and memory enhancement and failure</td>
</tr>
<tr>
<td>Generation and communication: Language, reading, dyslexia</td>
</tr>
<tr>
<td>Pursuing goals: Thinking, problem solving and acting</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Part 2: (Neuro)Cognitive Psychology in the wild II (seminar): winter</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the accompanying seminar we will work through recent examples in the literature for topics of the lecture. The goal is to apply novel knowledge from the lecture to understand and critically discuss actual research approaches.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reader's advisory</th>
</tr>
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</table>

<p>| Links |</p>
<table>
<thead>
<tr>
<th>Language of instruction</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration (semesters)</td>
<td>2 Semester</td>
</tr>
<tr>
<td>Module frequency</td>
<td>Part 1 will be offered every summer term, part 2 every winter term.</td>
</tr>
<tr>
<td>Module capacity</td>
<td>30</td>
</tr>
<tr>
<td>Modulievel</td>
<td>MM (Mastermodul / Master module)</td>
</tr>
<tr>
<td>Modulievel</td>
<td>MM (Mastermodul / Master module)</td>
</tr>
<tr>
<td>Modulart</td>
<td>Wahlpflicht / Elective</td>
</tr>
<tr>
<td>Modulart</td>
<td>Wahlpflicht / Elective</td>
</tr>
<tr>
<td>Lern-/Lehrform / Type of program</td>
<td>Part 1: 1 lecture (2 SWS); Part 2: 1 seminar (2 SWS)</td>
</tr>
<tr>
<td>Lern-/Lehrform / Type of program</td>
<td>Part 1: 1 lecture (2 SWS); Part 2: 1 seminar (2 SWS)</td>
</tr>
<tr>
<td>Vorkenntnisse / Previous knowledge</td>
<td></td>
</tr>
<tr>
<td>Final exam of module</td>
<td>Time of examination</td>
</tr>
<tr>
<td></td>
<td>last class in summer term</td>
</tr>
<tr>
<td>Course type</td>
<td>Comment</td>
</tr>
<tr>
<td>Lecture</td>
<td></td>
</tr>
<tr>
<td>Seminar</td>
<td></td>
</tr>
<tr>
<td>Total time of attendance for the module</td>
<td></td>
</tr>
</tbody>
</table>
psy220 - Human Computer Interaction

Module label  Human Computer Interaction
Module code    psy220
Credit points  6.0 KP
Workload       180 h

Used in course of study
• Master's Programme Neurocognitive Psychology (Master) > Mastermodule

Contact person
Module responsibility
○ Jochem Rieger
Authorized examiners
○ Jochem Rieger

Entry requirements
Enrolment in Master's programme Neurocognitive Psychology or other programs related to the field (e.g. neuroscience, computer science, physics etc.).

Skills to be acquired in this module

Goals of module:
The goal of the module is to provide students with basic skills required to plan, implement and evaluate brain computer interfaces as devices for human computer interaction. BCIs are an ideal showcase as they fully span the interdisciplinary field of HCI design, implementation and evaluation. Moreover, BCI-techniques can be used for modern data-driven basic neuroscience.

The module combines a lecture on the theoretical foundations of the most important techniques with a seminar/hands on course in which students learn to implement the BCI-processing steps on real neurophysiological data and further elaborate specific subtopics.

Competencies:
++ Understanding of the foundations of statistical learning techniques
+ provide basics to understand technical time series processing and machine learning papers
++ interdisciplinary knowledge & thinking
+ experimental methods
++ statistics & scientific programming
+ critical & analytical thinking
+ scientific communication skills
+ knowledge transfer
+ group work
+ project & time management

Module contents

Part 1: HCI and BCI Lecture: (Lecture on methodological foundations of BCI): summer

Part 2: Hands on BCI implementation (practical seminar): summer

Topics covered:
• A brief history of BCIs and examples of HCI control and basic neuroscience using BCI techniques.
• Data preprocessing (e.g. filtering, projection techniques) and common artifacts and artifact treatment.
• Feature generation (e.g. fourier transform, spectral estimation techniques, principle components).
• Machine learning for classification and regression (e.g. model parameter optimization in multivariate regression).
• Evaluation (e.g. measures of model quality, cross validation to test model generalization, permutation tests).

Where possible the lecture provides mathematical backgrounds of the data analysis techniques. The practical seminar implements BCI techniques on a real data set and further elaborates specific topics in seminar form.

Reader's advisory

There is no required textbook. The lecture slides and notes should be sufficient. However some resources from which they were developed are given below:

General tutorial text providing and overview and accompanying python code on github:


Signal processing:


PCA & SVD


Unsupervised feature Learning and deep learning tutorial:


General texts:

Machine learning and AI:

Hastie, Tibshirani, and Friedman. The elements of statistical learning. Covers a wide range of machine learning topics. Free online.


Additional literature and material will be provided on the course website.

Links

Language of instruction English
Duration (semesters) 1 Semester
Module frequency The module will be offered every summer term.
Module capacity 15
Reference text We strongly recommend to take either psy170, psy270, psy280, or psy220 to gain methodological competencies (EEG, fMRI, TBS, HCI) that are needed for most practical projects and Master's theses!
Modullevel MM (Mastermodul / Master module)
Modulart Wahlpflicht / Elective
Lern-Lehrform / Type of program Part 1: lecture; Part 2: practical seminar
Lern-Lehrform / Type of program Part 1: lecture; Part 2: practical seminar
Vorkenntnisse / Previous knowledge Basic programming skills, some high-school level maths
Vorkenntnisse / Previous knowledge Basic programming skills, some high-school level maths
Examination Time of examination Type of examination
Final exam of module last lecture in summer term The module will be evaluated with an oral exam (max. 20 min).
Required active participation for gaining credits: 1-2 presentations max. 24 programming exercises in the seminar participation in discussions on other presentations attendance of at least 70% in the seminar (use attendance sheet that will be handed out in the beginning of the term).
Course type Comment SWS Frequency Workload attendance
Lecture 2.00 SuSe 28 h
Seminar 2.00 SuSe 28 h
Total time of attendance for the module 56 h
psy230 - Neuromodulation of Cognition

Module label Neuromodulation of Cognition
Module code psy230
Credit points 6.0 KP
Workload 180 h
Used in course of study • Master's Programme Neurocognitive Psychology (Master) > Mastermodule

Contact person
Module responsibility
- Jochem Rieger
Authorized examiners
- Jochem Rieger

Entry requirements Enrolment in Master's programme Neurocognitive Psychology. Neuroscience students can take part on request.

Skills to be acquired in this module

Goals of module:
The aim of this module is to provide students with a theoretical background on how cognitive functions can be altered via neuromodulation.

Competencies:
++ Neuropsychological / neurophysiological knowledge
+ interdisciplinary knowledge & thinking
++ experimental methods
+ ethics / good scientific practice / professional behavior
+ critical & analytical thinking
+ scientific communication skills

Module contents
Students will be introduced to the concepts of neuromodulation and the application of theoretical knowledge of neurophysiology to the modulation of cognitive functions.

Part 1: Neuromodulation of cognition (lecture): winter
- Neurotransmitter and neuromodulator systems
- Neuropharmacological intervention
- Mechanisms of neural plasticity
- Neurofeedback
- Electric and magnetic brain stimulation
- Therapeutical applications

Part 2: Topics in Neuromodulation (seminar): winter
- Psychological an therapeutical effects of neuromodulation
- Modulation of neuronal network function
- Deep brain stimulation for therapeutical modulation

Reader's advisory


Links
Language of instruction English
Duration (semesters) 1 Semester
Module frequency The module will be offered every winter term.
Module capacity 15
| Modullevel | MM (Mastermodul / Master module) |
| Modullevel | MM (Mastermodul / Master module) |
| Modulart   | Wahlpflicht / Elective           |
| Modulart   | Wahlpflicht / Elective           |
| Lern-/Lehrform / Type of program | Part 1: lecture; Part 2: seminar |
| Lern-/Lehrform / Type of program | Part 1: lecture; Part 2: seminar |
| Vorkenntnisse / Previous knowledge | |

| Examination | Time of examination | Type of examination |
| Final exam of module | during winter term | Presentation 80% written test on the topics of the lecture 20% |
| Required active participation for gaining credits: participation in discussions on other presentations attendance of at least 70% in the seminar (use attendance sheet that will be handed out in the beginning of the term). |

| Course type | Comment | SWS | Frequency | Workload attendance |
| Lecture    |         | 2.00 | WiSe      | 28 h                |
| Seminar    |         | 2.00 | WiSe      | 28 h                |

Total time of attendance for the module 56 h
psy240 - Computation in Neuroscience

<table>
<thead>
<tr>
<th>Module label</th>
<th>Computation in Neuroscience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module code</td>
<td>psy240</td>
</tr>
<tr>
<td>Credit points</td>
<td>9.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>270 h</td>
</tr>
<tr>
<td>Used in course of study</td>
<td>Master's Programme Neurocognitive Psychology (Master) &gt; Mastermodule</td>
</tr>
<tr>
<td>Contact person</td>
<td></td>
</tr>
<tr>
<td>Module responsibility</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Heiko Stecher</td>
</tr>
<tr>
<td>Authorized examiners</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Heiko Stecher</td>
</tr>
<tr>
<td>Entry requirements</td>
<td>Enrolment in Master's programme Neurocognitive Psychology.</td>
</tr>
</tbody>
</table>

Skills to be acquired in this module

**Goals of module:**
Students will acquire scientific programming skills as well as specific knowledge of computational methods in neuroscience and cognition. They will learn to judge the appropriateness and complexity of computational problems and solutions.

**Competencies:**
- Neuropsychological / neurophysiological knowledge
- Experimental methods
- Statistical & scientific programming
- Critical & analytical thinking
- Knowledge transfer
- Group work

Module contents

**Part 1:** Introduction to scientific programming I (lecture): winter
Basic data types and structures
Flow control (conditions, loops, errors)
Testing and debugging
Functions

**Part 2:** Introduction to scientific programming II (lecture): summer
Complex data structures
EEG processing
Frequency analysis methods
Introduction to toolboxes

**Part 3:** Scientific programming I (exercise): winter
Implementation of examples from part 1

**Part 4:** Scientific programming II (exercise): summer
Implementation of examples from part 2

**Part 5:** Computer-controlled experimentation (seminar): summer
Computer hardware basics
Scripting and programming in Presentation
Combining stimulus delivery with EEG
Temporal precision

Reader's advisory

- Mathworks (2009): MATLAB online documentation
Language of instruction
English

Duration (semesters)
2 Semester

Module frequency
The module will start every winter term.

Module capacity
unlimited

Reference text
Important note: Passing the exam of psy240 is mandatory for starting a Practical Project (psy260) and the Master’s thesis.

Module level
MM (Mastermodul / Master module)

Module level
MM (Mastermodul / Master module)

Module type
Pflicht / Mandatory

Module type
Pflicht / Mandatory

Lern-Lehrform / Type of program
Part 1 and 2: lectures; Part 3 and 4: exercises; Part 5: seminar; additional tutorials

Lern-Lehrform / Type of program
Part 1 and 2: lectures; Part 3 and 4: exercises; Part 5: seminar; additional tutorials

Vorkenntnisse / Previous knowledge

Examination
Time of examination
Type of examination

Final exam of module
exam period at the end of the summer term

The participants will have to independently develop and program a solution for a given neuroscientific problem. Both the written code as well as the documentation of the approach taken will be assessed.

Required active participation for gaining credits: script for the presentation of experimental stimuli in part 5 attendance of at least 70% in the seminar ‘Presentation’, part 5 (use attendance sheet that will be handed out in the beginning of the term).

Course type
Comment
SWS
Frequency
Workload attendance
Lecture
4.00
SuSe and WiSe
56 h
Seminar
2.00
SuSe
28 h
Exercises
2.00
SuSe and WiSe
28 h
Tutorial
0.00
SuSe or WiSe
0 h

Total time of attendance for the module
112 h
psy251 - Internship

Module label: Internship
Module code: psy251
Credit points: 12.0 KP
Workload: 360 h

Used in course of study:
- Master's Programme Neurocognitive Psychology (Master) > Mastermodule

Contact person:
- Module responsibility: Cornelia Kranczioch-Debener
- Authorized examiners: Cornelia Kranczioch-Debener

Entry requirements:
Enrolment in Master's programme Neurocognitive Psychology.

Skills to be acquired in this module:

Goals of module:
Students will obtain provide direct experience in the field of psychology. This includes being involved in the provision of psychological or neuropsychological services in real-life situations, such as neuropsychological testing or counselling in a hospital or mental health clinic, or conducting and contributing to psychological research. The internship should be chosen by the student such that it can provide a meaningful educational opportunity that will help students to decide on their preferred area of work.

Competencies:
- ++ expert neuropsychological/neurophysiological knowledge
- + interdisciplinary knowledge & thinking
- + experimental methods
- ++ ethics / good scientific practice / professional behavior
- ++ knowledge transfer
- + project & time management

Module contents:
The students will work in a field of psychology of personal choice. The student will get to know and participate in the daily work routines of a psychologist.

Reader's advisory:

Links:
Information on internships and necessary forms: https://uol.de/en/psychology/master/course-overview/

Languages of instruction:
English , German

Duration (semesters):
1 Semester

Module frequency:
irregular

Module capacity:
unlimited

Reference text:
The internship lasts 360 hours (9-10 weeks). It can be performed at 2 different institutions with a minimum duration of 150 hours (4 weeks) for each part.

A part of your internship (maximally 150 hours) can be performed internally in the Department of Psychology. Internal internships cannot be performed in the same lab in which you will perform / have performed your Practical Project psy260!

Your supervisor must be a psychologist. If your supervisor is NOT a psychologist, please contact us for approval BEFORE you start your internship.

Please note that details are regulated in the exam regulations. A blank internship certificate and the report form can be found on the programme website.

To generate ideas, a folder with information on internships that other students have performed is available in the office of Dr. Cornelia Kranczioch.

Modullevel:
MM (Mastermodul / Master module)

Modulart:
Pflicht / Mandatory

Lern-/Lehrform / Type of program:
internship at (external) institution
<table>
<thead>
<tr>
<th>Lern-/Lehrform / Type of program</th>
<th>internship at (external) institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vorkenntnisse / Previous knowledge</td>
<td></td>
</tr>
<tr>
<td>Examination</td>
<td>Time of examination</td>
</tr>
<tr>
<td>Final exam of module</td>
<td>Individual; 2-3 possibilities per semester to present the internship to other students</td>
</tr>
<tr>
<td>Course type</td>
<td>Practical</td>
</tr>
<tr>
<td>SWS</td>
<td>0.00</td>
</tr>
<tr>
<td>Frequency</td>
<td>SuSe or WiSe</td>
</tr>
<tr>
<td>Workload attendance</td>
<td>0 h (360 hours presence at internship institution)</td>
</tr>
</tbody>
</table>
psy260 - Practical project

<table>
<thead>
<tr>
<th>Module label</th>
<th>Practical project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module code</td>
<td>psy260</td>
</tr>
<tr>
<td>Credit points</td>
<td>9.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>270 h</td>
</tr>
<tr>
<td></td>
<td>attendance in the lab and accompanying seminars as necessary for your project (~ 200h)</td>
</tr>
</tbody>
</table>

**Used in course of study**
- Master's Programme Neurocognitive Psychology (Master) > Mastermodule

**Contact person**

- Module responsibility
  - Jochem Rieger
  - Christoph Siegfried Herrmann
  - Stefan Debener
  - Andrea Hildebrandt
  - Sebastian Puschmann

- Authorized examiners
  - Arkan Al-Zubaidi
  - Martin Georg Bleichner
  - Stefan Debener
  - Carsten Gießing
  - Andreas Hellmann
  - Christoph Siegfried Herrmann
  - Andrea Hildebrandt
  - Helmut Hildebrandt
  - Florian Kasten
  - Cornelia Kranczioch-Debener
  - Xinyang Liu
  - Josef Meekes
  - Bojana Mirkovic
  - Jale Nur Özyurt
  - Jochem Rieger
  - Helko Stecher
  - Daniel Strüber
  - Christiane Margarete Thiel
  - Anirudh Unni
  - Maria Meyer-Abich de Sousa Guerreiro
  - Sebastian Puschmann

- Module counseling
  - Riklef Weerda

**Further responsible persons**

Upon approval by the examination committee other staff members (e.g. PhD students in the laboratories of the Department of Psychology) can act as examiners for psy260.

**Entry requirements**

- Enrolment in Master's programme Neurocognitive Psychology.
- You can only start the practical project if you have passed the exam of psy240 (psy241) Computation in Neuroscience!
- Priority is given to students with experience in methods used in the respective lab or students who have taken the respective teaching modules.

**Skills to be acquired in this module**

**Goals of module:**
Students will learn to plan, perform and analyse a study in the field of neurocognition. They will need to apply statistical knowledge and programming competencies to the data acquisition and analysis of data. Results will be related to the current neurocognitive literature and presented in a student poster symposium at the end of the module. Additionally, students should gain experience as participants in studies.

**Competencies:**
- ++ experimental methods
- + statistics & scientific programming
- ++ data presentation & discussion
- + independent research
- + scientific literature
Module contents

- The students develop an empirical investigation, carry it out and analyse the results.
- The students present and discuss their project in respect to recent literature in regular meetings and in a poster symposium.
- Students can develop an experimental design for a follow-up study which could potentially be the topic of their Master's thesis.
- As part of the practical project, students should participate in studies of other practical projects!

Reader's advisory

Language of instruction
English

Duration (semesters)
1 Semester

Module capacity
unlimited

Reference text
Topics for projects will be presented in a colloquium at the end of the summer term.

Students can choose to perform the practical work in either of the research groups of the Department of Psychology. External projects are possible upon approval (information and approval form can be found on the programme website).

Duration: 1 Semester

Module frequency
The module will be offered every winter term.

Module capacity
unlimited

Reader's advisory

Language of instruction
English

Duration (semesters)
1 Semester

Module capacity
unlimited

Reference text
Topics for projects will be presented in a colloquium at the end of the summer term.

Students can choose to perform the practical work in either of the research groups of the Department of Psychology. External projects are possible upon approval (information and approval form can be found on the programme website).

Modullevel
MM (Mastermodul / Master module)

Modullevel
MM (Mastermodul / Master module)

Modulart
Pflicht / Mandatory

Modulart
Pflicht / Mandatory

Lern-/Lehrform / Type of program
practical work and regular seminar meetings in the group where the project is performed

Lern-/Lehrform / Type of program
practical work and regular seminar meetings in the group where the project is performed

Vorkenntnisse / Previous knowledge
PLEASE NOTE:

Many projects require knowledge of either EEG, fMRI, TBS, or HCI analysis! We strongly recommend to take either psy170: Neurophysiology, psy270: fMRI Data Analysis, psy280: Transcranial Brain Stimulation, or psy220 Human Computer Interaction prior to the practical project.

It is expected that students have basic knowledge of Matlab programming before starting the practical project. This is proven by having passed the exam in Computation in Neuroscience.

Vorkenntnisse / Previous knowledge
PLEASE NOTE:

Many projects require knowledge of either EEG, fMRI, TBS, or HCI analysis! We strongly recommend to take either psy170: Neurophysiology, psy270: fMRI Data Analysis, psy280: Transcranial Brain Stimulation, or psy220 Human Computer Interaction prior to the practical project.

It is expected that students have basic knowledge of Matlab programming before starting the practical project. This is proven by having passed the exam in Computation in Neuroscience.

Examination

Final exam of module
usually end of April

Poster presentation in a student symposium (30% of the grade) and daily project work (70% of the grade).

Course type
Seminar

Comment
Please select the group in which you perform your practical project.

SWS
2.00

Frequency
WiSe

Workload attendance
28 h

Practical
attendance as necessary for your project (~ 200h)

SWS
0.00

Frequency
WiSe

Workload attendance
0 h

Total time of attendance for the module
28 h
psy270 - Functional MRI Data Analysis

**Module label**
Functional MRI Data Analysis

**Module code**
psy270

**Credit points**
9.0 KP

**Workload**
270 h

**Used in course of study**
- Master's Programme Neurocognitive Psychology (Master) > Mastermodule

**Contact person**
Module responsibility
- Carsten Gießing
Authorized examiners
- Carsten Gießing

**Entry requirements**
Enrolment in Master's programme Neurocognitive Psychology.

**Skills to be acquired in this module**

**Goals of module:**
Students will learn the basics about planning and performing a neuroimaging study. They will focus on the statistical and methodological background of functional neuroimaging data analysis and analyse a sample functional MRI data set.

**Competencies:**
++ experimental methods
++ statistics & scientific programming
+ data presentation & discussion
++ group work

**Module contents**
Theoretical knowledge on functional MRI data analysis
Planning, performance and analysis of functional neuroimaging studies using MATLAB-based software
Hands-on fMRI data analysis with SPM

**Reader's advisory**

**Links**

**Language of instruction**
English

**Duration (semesters)**
1 Semester

**Module frequency**
The module will be offered every summer term.

**Module capacity**
15 (The remaining places are reserved for Biology and Neuroscience students.)

**Reference text**
Since the module is primarily offered for the Master's programme Biology it has to be offered as a blocked course. Please contact us if you are interested in the module but have problems with interfering other courses.

PLEASE NOTE:
We strongly recommend to take either psy170, psy270, psy280, or psy220 to gain methodological competencies (EEG, fMRI, TBS, HCI) that are needed for most practical projects and Master's theses!

**Modullevel**
MM (Mastermodul / Master module)

**Modulart**
Wahlpflicht / Elective
<table>
<thead>
<tr>
<th>Lern-/Lehrform / Type of program</th>
<th>blocked course with lecture, interactive seminar and exercise parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lern-/Lehrform / Type of program</td>
<td>blocked course with lecture, interactive seminar and exercise parts</td>
</tr>
<tr>
<td>Vorkenntnisse / Previous knowledge</td>
<td>Students need to have solid statistical knowledge as taught in the Introductory Course Statistics and in Research Methods.</td>
</tr>
<tr>
<td>Vorkenntnisse / Previous knowledge</td>
<td>Students need to have solid statistical knowledge as taught in the Introductory Course Statistics and in Research Methods.</td>
</tr>
</tbody>
</table>

**Examination**

<table>
<thead>
<tr>
<th>Examination</th>
<th>Time of examination</th>
<th>Type of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final exam of module</td>
<td>end of summer term</td>
<td>Oral or written examination</td>
</tr>
</tbody>
</table>

Required active participation for gaining credits:
- 1-2 presentations
- participation in discussions on other presentations
- attendance of at least 70% in the seminars and exercises (use attendance sheet that will be handed out in the beginning of the term).

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td></td>
<td>2.00</td>
<td>SuSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Exercises</td>
<td></td>
<td>2.00</td>
<td>SuSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Seminar</td>
<td></td>
<td>1.00</td>
<td>SuSe</td>
<td>14 h</td>
</tr>
</tbody>
</table>

**Total time of attendance for the module**: 70 h
Essentials of fMRI Data Analysis with SPM and FSL

Module label: Essentials of fMRI Data Analysis with SPM and FSL
Module code: psy276
Credit points: 9.0 KP
Workload: 270 h
Used in course of study: Master's Programme Neurocognitive Psychology (Master) > Mastermodule

Contact person:
- Module responsibility: Riklef Weerda, Peter Sörös
- Authorized examiners: Riklef Weerda

Entry requirements:
Enrolment in Master's programme Neurocognitive Psychology, 3rd semester or higher.

Skills to be acquired in this module:
Goals of this module:
This module offers a concise introduction to the basic principles of functional magnetic resonance imaging (fMRI). Students will gain essential knowledge about experimental design, data collection and analysis. Special emphasis will be laid on the statistical background of fMRI data analysis and a hands-on introduction to SPM and FSL, two widely-used and free software packages for fMRI data analysis and results visualisation.

Competencies:
- Neuropsychological / neurophysiological knowledge
- Interdisciplinary knowledge & thinking
- Experimental methods
- Statistics & scientific programming
- Data presentation & discussion
- Independent research
- Scientific literature
- Ethics / good scientific practice / professional behaviour
- Critical & analytical thinking
- Group work

Module contents:
- Methodological basics of functional magnetic resonance imaging (fMRI)
- Basic principles of fMRI experimental design and data collection
- Statistical background of fMRI data analysis
- Hands-on training in fMRI data analysis and results visualisation with SPM and FSL

Reader's advisory:

Links:
- Language of instruction: English
- Duration (semesters): 1 Semester
- Module frequency: The module will be offered in the winter term, blocked in the first half (seven weeks).
- Module capacity: unlimited
- Reference text: PLEASE NOTE: We strongly recommend to take either psy170, psy270, psy276, psy280, or psy220 to gain methodological competencies (EEG, fMRI, TBS, HCI) that are needed for most practical projects and Master's theses! You can take either psy270 or psy276 due to overlapping content.
- Module level: MM (Mastermodul / Master module)
<table>
<thead>
<tr>
<th>Modullevel</th>
<th>MM (Mastermodul / Master module)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modulart</td>
<td>Wahlpflicht / Elective</td>
</tr>
<tr>
<td>Modulart</td>
<td>Wahlpflicht / Elective</td>
</tr>
</tbody>
</table>
| Lern-/Lehrform / Type of program | Part 1: 1 seminar (2 SWS)  
Part 2: 1 supervised exercise (3 SWS) |
| Lern-/Lehrform / Type of program | Part 1: 1 seminar (2 SWS)  
Part 2: 1 supervised exercise (3 SWS) |
| Vorkenntnisse / Previous knowledge | |
| Examination | Time of examination  
Type of examination |
| Final exam of module | end of winter term  
written exam |
| Required active participation for gaining credits:  
1 presentation  
participation in discussions on other presentations  
attendance of at least 70% in the seminars and  
exercises (use attendance sheet that will be handed  
out in the beginning of the term). |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Seminar    | 2.00    | WiSe | 28 h    |
| Exercises  | 3.00    | WiSe | 42 h    |
| Total time of attendance for the module | 70 h |
psy280 - Transcranial Brain Stimulation

Module label: Transcranial Brain Stimulation
Module code: psy280
Credit points: 6.0 KP
Workload: 180 h

Used in course of study:
- Master's Programme Neurocognitive Psychology (Master) > Mastermodule

Contact person:
Module responsibility
- Christoph Siegfried Herrmann
Authorized examiners
- Christoph Siegfried Herrmann
- Daniel Strüber

Entry requirements:
Enrolment in Master’s programme Neurocognitive Psychology.

Skills to be acquired in this module:
- Goals of module:
  Students will gain theoretical and practical knowledge on various non-invasive brain stimulation techniques.
- Competencies:
  - Neuropsychological / neurophysiological knowledge
  - Experimental methods
  - Statistics & scientific programming
  - Scientific literature
  - Ethics / good scientific practice / professional behaviour

Module contents:
In this module, we will introduce the theoretical concepts, neurophysiological underpinnings and neurocognitive as well as clinical applications of various non-invasive brain stimulation techniques such as transcranial magnetic stimulation (TMS), transcranial direct current stimulation (tDCS), transcranial alternating current stimulation (tACS), and transcranial random noise stimulation (tRNS). A focus will be tACS, because it is especially suited to modulate brain oscillations which have been shown to correlate with cognitive processes.

Part 1: Introduction to transcranial brain stimulation (lecture): summer
- Historical overview of brain stimulation
- Different techniques (TMS, tDCS, tACS, tRNS)
- Physiological mechanisms (entrainment, after-effects etc.)
- The use of transcranial brain stimulation in cognitive neuroscience - Experimental parameters (intensity, electrode montage, etc.)
- Pros and cons of TMS vs. tACS
- Technical aspects (artifact correction, modeling current flow, etc.)
- Safety issues
- Ethical considerations of brain stimulation

Part 2: Effects of tACS on physiology and cognition (seminar): summer
- Physiology of tACS (on-line and after-effects)
- Modulating cognitive functions (e.g. memory, attention, and perception)
- Clinical applications of tACS
- Hands-on experience in the lab

Reader's advisory:
## Links

<table>
<thead>
<tr>
<th>Language of instruction</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration (semesters)</td>
<td>1 Semester</td>
</tr>
<tr>
<td>Module frequency</td>
<td>The module will be offered every summer term.</td>
</tr>
<tr>
<td>Module capacity</td>
<td>10</td>
</tr>
<tr>
<td>Reference text</td>
<td>We strongly recommend to take either psy170, psy270, psy280, or psy220 to gain methodological competencies (EEG, fMRI, TBS, HCI) that are needed for most practical projects and Master's thesis!</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Module level</th>
<th>MM (Mastermodul / Master module)</th>
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</thead>
<tbody>
<tr>
<td>Modulart</td>
<td>Wahlpflicht / Elective</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Lern-/Lehrform / Type of program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part 1: lecture; Part 2: seminar</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vorkenntnisse / Previous knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examination</td>
</tr>
<tr>
<td>Final exam of module</td>
</tr>
</tbody>
</table>

Required active participation for gaining credits: attendance of at least 70% in the seminar (use attendance sheet that will be handed out in the beginning of the term).

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td></td>
<td>2.00</td>
<td>SuSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Seminar</td>
<td></td>
<td>2.00</td>
<td>SuSe</td>
<td>28 h</td>
</tr>
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<p>| Total time of attendance for the module | 56 h |</p>
<table>
<thead>
<tr>
<th>Module label</th>
<th>Computation in Neuroscience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module code</td>
<td>psy241</td>
</tr>
<tr>
<td>Credit points</td>
<td>6.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>180 h</td>
</tr>
<tr>
<td>Used in course of study</td>
<td>Master's Programme Neurocognitive Psychology (Master) &gt; Mastermodule</td>
</tr>
<tr>
<td>Contact person</td>
<td>Module responsibility</td>
</tr>
<tr>
<td></td>
<td>Heiko Stecher</td>
</tr>
<tr>
<td>Authorized examiners</td>
<td>Heiko Stecher</td>
</tr>
<tr>
<td>Entry requirements</td>
<td>Enrolment in Master's programme Neurocognitive Psychology.</td>
</tr>
<tr>
<td>Skills to be acquired in this module</td>
<td>Goals of module: Students will acquire scientific programming skills as well as specific knowledge of computational methods in neuroscience and cognition. They will learn to judge the appropriateness and complexity of computational problems and solutions.</td>
</tr>
<tr>
<td></td>
<td>Competencies: + Neuropsychological / neurophysiological knowledge + experimental methods ++ statistics &amp; scientific programming + critical &amp; analytical thinking + knowledge transfer + group work</td>
</tr>
<tr>
<td>Module contents</td>
<td>Part 1: Introduction to scientific programming I (theoretical-practical seminar)</td>
</tr>
<tr>
<td></td>
<td>• Basic data types and structures</td>
</tr>
<tr>
<td></td>
<td>• Flow control (conditions, loops, errors)</td>
</tr>
<tr>
<td></td>
<td>• Testing and debugging</td>
</tr>
<tr>
<td></td>
<td>• Functions</td>
</tr>
<tr>
<td></td>
<td>Part 2: Introduction to scientific programming II (theoretical-practical seminar)</td>
</tr>
<tr>
<td></td>
<td>• Classes and objects</td>
</tr>
<tr>
<td></td>
<td>• Parallel processing</td>
</tr>
<tr>
<td></td>
<td>• Frequency analysis methods</td>
</tr>
<tr>
<td></td>
<td>• EEG processing</td>
</tr>
<tr>
<td></td>
<td>Part 3: Scientific programming I (exercise)</td>
</tr>
<tr>
<td></td>
<td>• Implementation of examples from part 1</td>
</tr>
<tr>
<td></td>
<td>Part 4: Scientific programming II (exercise)</td>
</tr>
<tr>
<td></td>
<td>• Implementation of examples from part 2</td>
</tr>
<tr>
<td>Reader’s advisory</td>
<td>Mathworks (2009): MATLAB online documentation</td>
</tr>
<tr>
<td>Links</td>
<td>Language of instruction English</td>
</tr>
<tr>
<td>Duration (semesters)</td>
<td>2 Semester</td>
</tr>
<tr>
<td>Module frequency</td>
<td>The module will be offered every winter term.</td>
</tr>
<tr>
<td>Module capacity</td>
<td>unlimited</td>
</tr>
<tr>
<td>Modullevel</td>
<td>MM (Mastermodul / Master module)</td>
</tr>
<tr>
<td>Modulart</td>
<td>Pflicht / Mandatory</td>
</tr>
<tr>
<td>Lern-/Lehrform / Type of program</td>
<td>Part 1: theoretical-practical seminar; Part 2: theoretical-practical seminar; Part 3: excercise; Part 4: exercise; additional tutorials</td>
</tr>
</tbody>
</table>
|-------------------------------|---------------------------------------------------------------------------------
| Vorkenntnisse / Previous knowledge |                                                                                     |
| Examination | Time of examination | Type of examination | The participants will have to independently develop and program a solution for a given neuroscientific problem. Both the written code as well as the documentation of the approach taken will be assessed. Bonus for regularly handing in a total of 12 programming exercises. |
| Final exam of module | exam period at the end of the summer term |                                                                                     |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Theorie-Praxis-Seminare | 2 semester hours per week for winter and summer term | 4.00 | SuSe and WiSe | 56 h |
| Exercises | 1 semester hour per week for winter and summer term. | 2.00 | SuSe and WiSe | 28 h |
| Tutorial | 2 semester hours per week in winter and summer term | 0.00 | SuSe and WiSe | 0 h |
| Total time of attendance for the module |                                                                                     | 84 h |
# psy250 - Internship

<table>
<thead>
<tr>
<th>Module label</th>
<th>Internship</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module code</td>
<td>psy250</td>
</tr>
<tr>
<td>Credit points</td>
<td>15.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>450 h</td>
</tr>
<tr>
<td>Used in course of study</td>
<td>Master's Programme Neurocognitive Psychology (Master) &gt; Mastermodule</td>
</tr>
</tbody>
</table>

**Contact person**
- Module responsibility: Comelia Kranczioch-Debener
- Authorized examiners: Comelia Kranczioch-Debener

**Entry requirements**
Enrolment in Master's programme Neurocognitive Psychology.

**Skills to be acquired in this module**
- **Goals of module:**
  Students will obtain provide direct experience in the field of psychology. This includes being involved in the provision of psychological or neuropsychological services in real-life situations, such as neuropsychological testing or counselling in a hospital or mental health clinic, or conducting and contributing to psychological research. The internship should be chosen by the student such that it can provide a meaningful educational opportunity that will help students to decide on their preferred area of work.
- **Competencies:**
  - ++ expert neuropsychological/neurophysiological knowledge
  - + interdisciplinary knowledge & thinking
  - + experimental methods
  - ++ ethics / good scientific practice / professional behavior
  - ++ knowledge transfer
  - + project & time management

**Module contents**
The student will work in a field of psychology of personal choice. The student will get to know and participate in the daily work routines of a psychologist.

**Reader's advisory**
Information on internships and necessary forms: [https://uol.de/en/psychology/master/course-overview/](https://uol.de/en/psychology/master/course-overview/)

**Languages of instruction**
English, German

**Duration (semesters)**
1 Semester

**Module frequency**
irregular

**Module capacity**
unlimited

**Reference text**
The internship lasts 450 hours (12 weeks). It can be performed at 2 different institutions with a minimum duration of 150 hours (4 weeks) for each part. Your supervisor must be a psychologist.

Please note that details are regulated in the exam regulations.

To generate ideas, a folder with information on internships that other students have performed is available in the office of Dr. Comelia Kranczioch.

**Module level**
MM (Mastermodul / Master module)

**Modulart**
Pflicht / Mandatory

**Lern-/Lehrform / Type of program**
Internship at (external) institution

**Vorkenntnisse / Previous knowledge**

<table>
<thead>
<tr>
<th>Examination</th>
<th>Time of examination</th>
<th>Type of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final exam of module</td>
<td>Individual; 2-3 possibilities per semester to present the internship to other students</td>
<td>The students have to hand in a written report (2-3 pages) and give a short presentation about their internship. They have to show a certificate from the institution at which they performed the internship. The internship is evaluated as pass/fail.</td>
</tr>
</tbody>
</table>

**Course type**
Practical

**SWS**
0.00

**Frequency**
SuSe and WiSe

**Workload attendance**
0 h / 450 h attendance at internship institution
psy120 - Psychological diagnostics

Module label: Psychological diagnostics
Module code: psy120
Credit points: 9.0 KP
Workload: 270 h

Used in course of study:
- Master's Programme Neurocognitive Psychology (Master) > Mastermodule

Contact person

Module responsibility
- Andrea Hildebrandt
- Andreas Hellmann

Authorized examiners
- Andrea Hildebrandt
- Andreas Hellmann

Module counseling
- Stefan Debener

Entry requirements

Skills to be acquired in this module

Module contents

Reader's advisory

Language of instruction: English

Duration (semesters): 2 Semester

Module frequency

Module capacity: unlimited

Modullevel

Modulart

Lern-Lehrform / Type of program

Vorkenntnisse / Previous knowledge

Examination

<table>
<thead>
<tr>
<th>Examination</th>
<th>Time of examination</th>
<th>Type of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final exam of module</td>
<td>Ú</td>
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</table>

Course type

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td></td>
<td>2.00</td>
<td>WiSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Seminar</td>
<td></td>
<td>4.00</td>
<td>SuSe</td>
<td>56 h</td>
</tr>
</tbody>
</table>

Total time of attendance for the module: 84 h
psy275 - Essentials of fMRI Data Analysis with SPM and FSL

Module label          Essentials of fMRI Data Analysis with SPM and FSL
Module code           psy275
Credit points         6.0 KP
Workload              180 h
                       { Attendance: 56 h. (4 SWS), reading and practising: 124 h., total: 180 h. }
Used in course of study • Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Contact person
Module responsibility
• Riklef Weerda
• Peter Sörös
Entry requirements Enrolment in Master's programme Neurocognitive Psychology, 3rd semester or higher.
Skills to be acquired in this module + Neuropsychological / neurophysiological knowledge
+ interdisciplinary knowledge & thinking
++ experimental methods
++ statistics & scientific programming
+ data presentation & discussion
+ independent research
+ scientific literature
+ ethics / good scientific practice / professional behaviour
+ critical & analytical thinking
+ group work

This module offers a concise introduction to the basic principles of functional magnetic resonance imaging (fMRI). Students will gain essential knowledge about experimental design, data collection and analysis. Special emphasis will be laid on the statistical background of fMRI data analysis and a hands-on introduction to SPM and FSL, two widely-used and free software packages for fMRI data analysis and results visualisation.

Module contents 1. Methodological basics of functional magnetic resonance imaging (fMRI)
2. Basic principles of fMRI experimental design and data collection
3. Statistical background of fMRI data analysis
4. Hands-on training in fMRI data analysis and results visualisation with SPM and FSL


Links

Language of instruction English
Duration (semesters) 1 Semester
Module frequency The module will be offered in the winter term, blocked in the first half (seven weeks).
Module capacity 20
Reference text PLEASE NOTE: We strongly recommend to take either psy170, psy270, psy275, psy280, or psy220 to gain methodological competencies (EEG, fMRI, TBS, HCI) that are needed for most practical projects and Master's theses!

Modullevel MM (Mastermodul / Master module)
Modulart Wahlpflicht / Elective
Lern- /Lehrform / Type of program Part 1: 1 seminar (1 SWS)
Part 2: 1 supervised exercise (3 SWS)

Vorkenntnisse / Previous knowledge

Examination Time of examination Type of examination

Final exam of module end of winter term written exam
Course type Comment SWS Frequency Workload attendance
Seminar 1.00 WiSe 14 h Attendance: 56 h. (4 SWS), reading and practising: 124 h., total: 180 h.

Exercises 3.00 WiSe 42 h Attendance: 56 h. (4 SWS), reading and practising: 124 h.,
<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>total: 180 h.</td>
</tr>
</tbody>
</table>

Total time of attendance for the module 56 h
psy200 - Neuropsychology

Module label: Neuropsychology
Module code: psy200
Credit points: 9.0 KP
Workload: 270 h

Used in course of study
- Master's Programme Neurocognitive Psychology (Master) > Mastermodule

Contact person
Module responsibility
- Stefan Debener
Authorized examiners
- Stefan Debener

Entry requirements
Enrolment in Master’s programme Neurocognitive Psychology.

Skills to be acquired in this module
Goals of module:
Students will learn to understand changes in thinking and behaviour that may arise from brain dysfunctions (part 1, 4), acquire specific knowledge on cognitive rehabilitation (part 2), and learn to understand, communicate and evaluate progress in clinical practice and experimental research in neuropsychology (part 3, 4).

Competencies:
++ neuropsychological / neurophysiological knowledge
+ interdisciplinary knowledge & thinking
++ experimental methods
+ data presentation & discussion
++ scientific literature
+ critical & analytical thinking
+ scientific communication skills

Module contents
Part 1: Introduction to Clinical Neuropsychology (lecture)
- Cortical lobes (anatomy, functions, lesion symptoms, neuropsychological tests)
- Higher functions (learning & memory, language, emotion, spatial behavior, attention)
- Plasticity and disorders (development, learning and reading disabilities, recovery)

Part 2: Cognitive Neurorehabilitation (seminar)
- Behavioural and neuropsychological approaches
- neurofeedback in neurorehabilitation and ADHD
- memory rehabilitation
- effects of physical activity on cognition
- motor recovery

Part 3: Research Colloquium Clinical and Experimental Neuropsychology (colloquium)
- Presentations covering recent advances in the field of Experimental and Clinical Neuropsychology

Part 4: Topics in Clinical Neuropsychology (seminar; taught partly in German)
- Clinical neuroanatomy
- Neurodegenerative diseases
- Dementia

Reader's advisory

Links
Languages of instruction
English , German
Duration (semesters)
2-3 Semester
Module frequency
The module will be offered every winter term.
Module capacity
30

Reference text
3 CP for each module part, choose 3 out of 4 parts! Part 1 (lecture) is mandatory.
If you want to earn the bonus, you need to use the official bonus sheet to prove your attendance which will be handed to you in the beginning of the winter term.

<table>
<thead>
<tr>
<th>Modullevel</th>
<th>MM (Mastermodul / Master module)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modulart</td>
<td>Wahlpflicht / Elective</td>
</tr>
<tr>
<td>Lern- / Lehrform / Type of program</td>
<td>Part 1: lecture; Part 2: seminar; Part 3: colloquium; Part 4: seminar</td>
</tr>
<tr>
<td>Vorkenntnisse / Previous knowledge</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Examination</th>
<th>Time of examination</th>
<th>Type of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final exam of module</td>
<td>exam period at the end of winter term</td>
<td>The module will be tested with a written exam of 2 h duration. Bonus for a presentation and participation in discussions on other presentations and attendance of at least 70% in the seminars and colloquium.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td></td>
<td>2.00</td>
<td>WiSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Seminar</td>
<td></td>
<td>4.00</td>
<td>SuSe and WiSe</td>
<td>56 h</td>
</tr>
<tr>
<td>Colloquium</td>
<td></td>
<td>2.00</td>
<td>SuSe</td>
<td>28 h</td>
</tr>
</tbody>
</table>

**Total time of attendance for the module**: 112 h
# psy140 - Minor

<table>
<thead>
<tr>
<th>Module label</th>
<th>Minor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module code</td>
<td>psy140</td>
</tr>
<tr>
<td>Credit points</td>
<td>9.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>270 h</td>
</tr>
<tr>
<td>Used in course of study</td>
<td>• Master's Programme Neurocognitive Psychology (Master) &gt; Mastermodule</td>
</tr>
<tr>
<td>Contact person</td>
<td>Module counseling</td>
</tr>
<tr>
<td></td>
<td>Kerstin Bleichner</td>
</tr>
<tr>
<td></td>
<td>Jochem Rieger</td>
</tr>
<tr>
<td>Entry requirements</td>
<td>Enrolment in Master's programme Neurocognitive Psychology.</td>
</tr>
<tr>
<td>Skills to be acquired in this module</td>
<td>Goals of module: Students will gain an overview of non-psychological topics related to cognitive neuroscience and neuropsychology. They will see how psychological theories apply in other fields. Students can strengthen their own professional profile.</td>
</tr>
<tr>
<td></td>
<td>Competencies ++ interdisciplinary knowledge &amp; thinking</td>
</tr>
<tr>
<td>Module contents</td>
<td>Students can take Master modules and courses from the fields</td>
</tr>
<tr>
<td></td>
<td>• Biology</td>
</tr>
<tr>
<td></td>
<td>• Neurosciences</td>
</tr>
<tr>
<td></td>
<td>• Computer Science</td>
</tr>
<tr>
<td></td>
<td>• Physics</td>
</tr>
<tr>
<td></td>
<td>• Mathematics</td>
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<tr>
<td></td>
<td>• Pedagogy</td>
</tr>
<tr>
<td></td>
<td>• Philosophy</td>
</tr>
<tr>
<td></td>
<td>• related fields</td>
</tr>
<tr>
<td></td>
<td>The content of the courses/modules taken as Minor needs to be clearly different from the contents of the Neurocognitive Psychology modules.</td>
</tr>
<tr>
<td></td>
<td>A list of approved courses/modules can be found on our website.</td>
</tr>
<tr>
<td></td>
<td>Upon approval, German-speaking students can attend a career-relevant language course (i.e. necessary for internship, practical project or Master's thesis; maximum of 6 CP for this module). Students whose first language is not German, may take German classes.</td>
</tr>
<tr>
<td></td>
<td>We recommend taking modules/courses that strengthen your own professional profile.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reader's advisory</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Links</td>
<td>List of approved courses/modules and approval form: <a href="https://uol.de/en/psychology/master/course-overview/">https://uol.de/en/psychology/master/course-overview/</a></td>
</tr>
<tr>
<td>Languages of instruction</td>
<td>English , German</td>
</tr>
<tr>
<td>Duration (semesters)</td>
<td>1 Semester</td>
</tr>
<tr>
<td>Module frequency</td>
<td>irregular</td>
</tr>
<tr>
<td>Module capacity</td>
<td>unlimited</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reference text</th>
<th>PLEASE NOTE:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• If you want to take a module/course which is not listed in the list of approved courses/modules, please request approval BEFORE you start the course/module (list of approved courses/modules and approval form can be found on our website)</td>
</tr>
<tr>
<td></td>
<td>• Bachelor level courses are NOT acceptable. Note that Bachelor level courses can be listed in some Master programmes (e.g. Master of Education). This does not qualify a Bachelor level course for the Minor module.</td>
</tr>
<tr>
<td></td>
<td>• It is your responsibility to ask the teacher whether you can take part.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Modullevel</th>
<th>MM (Mastermodul / Master module)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modulart</td>
<td>Pflicht / Mandatory</td>
</tr>
<tr>
<td>Lern-/Lehrform / Type of program</td>
<td>Lectures and seminars (depends on the chosen modules)</td>
</tr>
<tr>
<td>Vorkenntnisse / Previous knowledge</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Examination</th>
<th>Time of examination</th>
<th>Type of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final exam of module</td>
<td>If grades are earned in the minor, those are counted as pass/fail. Certificates for grades can be separately requested from the examination office.</td>
<td></td>
</tr>
<tr>
<td>Course type</td>
<td>Course or seminar</td>
<td></td>
</tr>
</tbody>
</table>
(Please refer to the module description for information on the courses you can have counted towards psy140 Minor.)

<table>
<thead>
<tr>
<th>SWS</th>
<th>0.00</th>
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<tbody>
<tr>
<td>Frequency</td>
<td>SuSe and WiSe</td>
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<tr>
<td>Workload attendance</td>
<td>0 h / Depends on the chosen course, but at least 14 hours attendance.</td>
</tr>
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</table>
Abschlussmodul

mam - Master´s Degree Module

<table>
<thead>
<tr>
<th>Module label</th>
<th>Master’s Degree Module</th>
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</thead>
<tbody>
<tr>
<td>Module code</td>
<td>mam</td>
</tr>
<tr>
<td>Credit points</td>
<td>30.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>900 h</td>
</tr>
<tr>
<td></td>
<td>{ attendance in the lab meetings: 28h (2 SWS); thesis work: 872 hours }</td>
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</table>

<table>
<thead>
<tr>
<th>Used in course of study</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Master's Programme Neurocognitive Psychology (Master) &gt; Abschlussmodul</td>
</tr>
</tbody>
</table>

Contact person

Authorized examiners

> Arkan Al-Zubaidi
> Martin Georg Bleichner
> Stefan Debenyo
> Carsten Gießing
> Andreas Hellmann
> Christoph Siegfried Herrmann
> Andrea Hildebrandt
> Helmut Hildebrandt
> Florian Kasten
> Comelia Kranczioch-Debener
> Xinyang Liu
> Josef Meekes
> Bojana Mirkovic
> Jale Nur Özyurt
> Jochem Rieger
> Heiko Stecher
> Daniel Strüber
> Christiane Margarete Thiel
> Anirudh Unni
> Sebastian Puschmann
> Maria Meyer-Abich de Sousa Guerreiro

Further responsible persons

thesis supervisors;
Upon approval by the examination committee other staff members (e.g. PhD students in the laboratories of the Department of Psychology) can act as examiners for mam.

Entry requirements

Enrolment in Master’s programme Neurocognitive Psychology.
Completion of at least 60 credit points in other modules including module psy240 (psy241) (Computation in Neuroscience).
Assignment of a topic by thesis supervisor and official application with the examination office.

Skills to be acquired in this module

Goals of module:
Students will demonstrate that they are able to perform a psychological experiment according to scientific standards. In addition, they will demonstrate that they are acquainted with the necessary methods and can present their results orally and in written form.

Competencies:
++ experimental methods
+ statistics & scientific programming
+ data presentation & discussion
++ independent research
+ scientific literature
++ scientific English / writing
+ ethics / good scientific practice / professional behavior
+ critical & analytical thinking
+ scientific communication skills
+ knowledge transfer
++ project & time management

Module contents

Part 1: Master’s thesis
The students work on a given topic in cognitive neuroscience using literature research and the appropriate experimental methods.
Part 2: Master's colloquium
The preparation of the thesis is accompanied by regular participation in the lab meetings of the groups in which the thesis is performed. Students present their study design at the beginning of their thesis preparation and their results towards the end. In addition, they listen to the presentations of the other lab members and students in the group.

<table>
<thead>
<tr>
<th>Reader's advisory</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Links</td>
<td>Rules and guidelines for Master's theses are explained here: <a href="https://uol.de/en/psychology/master/course-overview/">https://uol.de/en/psychology/master/course-overview/</a></td>
</tr>
<tr>
<td>Language of instruction</td>
<td>English</td>
</tr>
<tr>
<td>Duration (semesters)</td>
<td>1 Semester</td>
</tr>
<tr>
<td>Module frequency</td>
<td>irregular</td>
</tr>
<tr>
<td>Module capacity</td>
<td>unlimited</td>
</tr>
<tr>
<td>Reference text</td>
<td>If you want to do a Master's thesis outside the Department of Psychology, please follow the rules stated on the program website. We encourage students to use the LaTeX template provided on the course website.</td>
</tr>
<tr>
<td>Modullevel</td>
<td>Abschlussmodul (Abschlussmodul / Conclude)</td>
</tr>
<tr>
<td>Modullevel</td>
<td>MM (Mastermodul / Master module)</td>
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<tr>
<td>Modulart</td>
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</tr>
<tr>
<td>Modulart</td>
<td>Pflicht / Mandatory</td>
</tr>
<tr>
<td>Lern-Lehrform / Type of program</td>
<td>individual thesis preparation with supervision</td>
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<tr>
<td>Lern-Lehrform / Type of program</td>
<td>individual thesis preparation with supervision</td>
</tr>
<tr>
<td>Vorkenntnisse / Previous knowledge</td>
<td>contact your supervisor for details</td>
</tr>
<tr>
<td>Vorkenntnisse / Previous knowledge</td>
<td>contact your supervisor for details</td>
</tr>
<tr>
<td>Examination</td>
<td>Time of examination</td>
</tr>
<tr>
<td>Final exam of module</td>
<td>individual appointments</td>
</tr>
<tr>
<td>Course type</td>
<td>Seminar und Projekt</td>
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<tr>
<td>SWS</td>
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</tr>
<tr>
<td>Frequency</td>
<td>SuSe and WiSe</td>
</tr>
<tr>
<td>Workload attendance</td>
<td>28 h. (Attendance as required for your project and 2 hours per week for participating in the lab meetings.)</td>
</tr>
</tbody>
</table>